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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,843	02/04/2004	LcNoir E. Zaiser	2173.2007-001	9748

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EXAMINER

WEINSTEIN, LEONARD J

ART UNIT	PAPER NUMBER
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3746

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/771,843

Applicant(s)

ZAISER ET AL.

Examiner

Leonard J. Weinstein

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/4/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>04/04/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 5-11, 15-21, 36-37, and 46-47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claims 5-11, and 15-21 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: location, engagement with other structural elements, and structural limitations of elements including a first, second and third "check valves," and a first and second "pressure sensor" are not set forth by the claim. One of ordinary skill in the art could not ascertain how these elements contribute to the claimed invention and render the claims as listed indefinite.
5. Claims 36-37, and 46-47 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: how the invention as claimed forms two pistons with a size ratio of "about" 3.5 to 1, and provides a stroke of "about" 6 inches. The method

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claims limit the invention in such a way that one of ordinary skill in the art could not ascertain whether the invention is changing in structural form to create a size ratio or a stroke length.

The terms "forming," and "providing" are not steps of using the claimed invention, as recited in the claims, but steps of making elements within a pump.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-3, 5-9, 25-27, and 29-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Valavaara 4,734,013. Valavaara, in figures 1-2, teaches all the limitations as substantially claimed for a pump including: a housing 20 having a first chamber 24 and a second chamber 74, the first chamber 24 having a first inlet 36 and a first outlet 49, the second chamber 74 having a second inlet 80 and a second outlet 88, the second inlet 80 being in communication with the first outlet 49 of the first chamber (col. 7 ll. 53-55), a first piston 12 positioned within the first chamber 24, a second piston 14 positioned within the second chamber 74 and secured to the first piston 12, the diameter of the first piston 12 being larger than the diameter of the second piston 14, see figure 2, a drive system 52 for reciprocating the first 12 and second 14 pistons in unison within the first 24 and second chambers 74 such that when the first piston 12 is moving in an expansion stroke, fluid can be drawn into the first chamber 24 through the first inlet 36, and the second piston 14 is moving in a compression stroke where fluid can be expelled from the second chamber 74 through the second outlet 88 (col. 7 ll. 64-65), and when the first piston 12 is moving in a compression stroke the second

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piston 14 is moving in an expansion stroke where fluid can be expelled from the first chamber 24 through the first outlet 49 and into the second chamber 74 through the second inlet 80 (col.11. 34-40); a connecting member 16 for securing the first 12 and second 14 pistons together in a spaced apart manner along a common axis, figure 2, and extending between the first 24 and second chambers 74; a connecting member 16 includes a threaded screw 18, the drive system 52 including a rotatable nut 54 engaged with the threaded screw 18 and a reversible motor, rotary drive device on valve shaft of claim 2, for alternately rotating the nut in opposite directions, to cause reciprocating linear translation of the connecting member 16 and pistons, 12 and 14, (col. 3 ll. 17-25); a check valve system, 102 and 104 of embodiment of figure 1 or in the alternative 242, 256, and 258 in the embodiment of figure 6, for preventing back flow through the pump; further figure 6 of Valavaara teaches a check valve 242 for preventing fluid from exiting a first chamber 232 through a first inlet 246; a second check valve 256 for preventing fluid from exiting a second chamber 235 through a second inlet 254; and a third check valve 258 for preventing fluid from entering the second chamber 235 through the second outlet 260; and a piston position sensing system, 43, 68 and 78.

Further Valavara teaches all the limitations as substantially claimed for a method for pumping fluid including: positioning a first piston 12 within a first chamber 24 in a housing 20, the first chamber 24 having a first inlet 36 and a first outlet 49; positioning a second piston 14 within a second chamber 74 in the housing 20, the first 12 and second 14 pistons being secured to each other, via 16, and each having a diameter, the diameter of the first piston 12 being larger than the diameter of the second piston 14, figure 2, the second chamber 74 having a second inlet 80 and a second outlet 88, the second inlet 80 being in communication with the first outlet 49 of the first chamber 24, and reciprocating the first 12 and second 14 pistons in

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unison within the first 24 and second 74 chambers with a drive system 52 such that when the first piston 12 is moving in an expansion stroke, fluid is drawn into the first chamber through the first inlet, and at the same time, the second piston is moving in a compression stroke where fluid is expelled from the second chamber through the second outlet, and when the first piston is moving in a compression stroke, the second piston is moving in an expansion stroke where fluid is expelled from the first chamber through the first outlet and into the second chamber through the second inlet (col. 8 ll.4-40); securing the first 12 and second 14 pistons together in a spaced apart manner along a common axis, figure 2, with a connecting member 16 extending between the first 24 and second 74 chambers; a method in which connecting member 16 includes a threaded screw 18, the drive system 52 including a rotatable nut 54 engaged with the threaded screw 18, the method further comprising alternately rotating the nut 54 in opposite directions with a reversible motor, rotary drive device on valve shaft of claim 2, to cause reciprocating linear translation (col. 3 ll. 17-25) of the connecting member 16 and pistons, 12 and 14; a method comprising preventing back flow (col. 7 ll. 56-63 and col. 10 ll. 23-26, and 39-44) through the pump with a check valve system, 102 and 104 of embodiment of figure 1 or in the alternative 242, 256, and 258 in the embodiment of figure 6; preventing fluid from exiting a first chamber 232 through a first inlet 246 with a check valve 242; preventing fluid from exiting a second chamber 235 through a second inlet 254 with a second check valve 256; and preventing fluid from entering the second chamber 235 through the second outlet 260 with a third check valve 258 of the check valve system, as discussed above; and sensing piston position with a piston position sensing system, 43, 68 and 78 (col. 6 ll. 34-50).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1-12, 14-22, 24-36, 38-46, and 48 are rejected under 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones 4,85,967 in view of Ganzel 6,079,797. Jones teaches all the limitations as substantially claimed in figure 4 for a pump comprising the following: a housing 30 having a first chamber 410 and a second chamber 24, the first chamber 410 having a first inlet 222, the second chamber 24 having a second inlet 28, a first piston 240 positioned within the first chamber 410, a second piston 32 positioned within the second chamber 24 and secured, via 40, to the first piston 240, the first 240 and second 32 pistons each having a diameter, the diameter of the first piston being larger than the diameter of the second piston (col. 7 ll. 26-28) a connecting member 40 for securing the first 240 and second 32 pistons together in a spaced apart manner along a common axis, figure 4, and extending between the first 410 and second 24 chambers, the connecting member 40 including a threaded screw 43, a drive system (col. 6 ll. 31-44) for reciprocating the first 240 and second

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32 pistons in unison within the first and second chambers such that when the first piston 240 is moving in an expansion stroke, fluid can be drawn into the first chamber 410 through the first inlet 222, and at the same time, the second piston 32 is moving in a compression stroke where fluid can be expelled from the second chamber 24, and when the first piston 240 is moving in a compression stroke, the second piston 222 is moving in an expansion stroke where fluid can be expelled from the first chamber 410, the drive system including a rotatable ball screw nut 40 engaged with the threaded screw 42 and a reversible motor 60 for alternately rotating the nut 44 in opposite directions to cause reciprocating linear translation of the connecting member 40 and pistons, 240 and 32 (col. 5 ll. 16-21); a check valve system, 726, 728 and 780 of the embodiment in figure 5, for preventing back flow through the pump (col. 7 ll. 50-58 and col. 8 ll. 9-12); a piston position sensing system, 780 and 742; a first pressure sensor 780 for sensing pressure in the first chamber 410; a second pressure sensor, element 742 of the embodiment in figure 5, for sensing pressure of fluid expelled from the second chamber 32 (col. 8 ll. 42-44); a pump wherein the diameters of the first and second pistons have a difference in size of about a 3.5 to 1 ratio (col. 7 ll. 15-17); and a pump capable of pumping about 0.5 in³ of gas at about 2200 psi per cycle (col.1 ll. 26-30 and col. 9 ll. 35-38).

Further Jones teaches a method for pumping including the following: positioning a first piston 240 within a first chamber 410 in a housing 30, the first chamber 410 having a first inlet 222; positioning a second piston 32 within a second chamber 24 in the housing 30, the first 240 and second 32 pistons being secured to each other, via 40, and each having a diameter, the diameter of the first piston 240 being larger than the diameter of the second 32 piston, the second chamber 24 having a second inlet 28; securing the first 240 and second 410 pistons together in a spaced apart manner along a common axis with a connecting member 40

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extending between the first 410 and second 24 chambers; reciprocating the first 240 and second 32 pistons in unison within the first 410 and second 24 chambers with a drive system 40 such that when the first 240 piston is moving in an expansion stroke, fluid is drawn into the first chamber 410 through the first 222 inlet, and at the same time, the second piston 32 is moving in a compression stroke where fluid is expelled from the second chamber 24, and when the first piston 240 is moving in a compression stroke, the second piston 32 is moving in an expansion stroke where fluid is expelled from the first chamber 410; the drive system 60 including a rotatable ball screw nut 40 engaged with the threaded screw 42 and a reversible motor 60 for alternately rotating the nut 44 in opposite directions to cause reciprocating linear translation of the connecting member 40 and pistons, 240 and 32 (col. 5 ll. 16-21); and preventing back flow through the pump with a check valve system, 726, 728 and 780 of the embodiment in figure 5 (col. 7 ll. 50-58 and col. 8 ll. 9-12); sensing piston position with a piston position sensing system 780; sensing pressure in the first chamber 410 with a first pressure sensor 780; a method including sensing pressure (col. 8 ll. 42-44) of fluid expelled from the second chamber 24 with a second pressure sensor, element 742 of the embodiment in figure 5; forming the diameters of the first 240 and second 410 pistons to have a difference in size of about a 3.5 to 1 ratio (col. 7 ll. 15-17); pumping about 0.5 in³ of gas at about 2200 psi per cycle (col.1 ll. 26-30 and col. 9 ll. 35-38).

Jones fails to teach the following limitations taught by Ganzel for a pump and a method of using including: a housing 1 having a first chamber 25 and a second chamber 26, the first chamber having a first inlet 51 and a first outlet 56, the second chamber 26 having a second inlet 55 and a second outlet 52, the second inlet 55 being in communication with the first outlet 56 of the first chamber 25, fluid can be drawn into the first chamber 25 through the first inlet

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51, and at the same time, a second piston 20b is moving in a compression stroke where fluid can be expelled from the second chamber 26 through the second outlet 52 and when the first piston 20a is moving in a compression stroke, the second piston 20b is moving in an expansion stroke where fluid can be expelled from the first chamber 25 through the first outlet 56 and into the second chamber 26 through the second inlet 55 (col. 4 ll. 21-34); a first check valve 53 for preventing fluid from exiting the first chamber 25 through the first inlet 51; a second check valve 56 for preventing fluid from exiting the second chamber 26 through the second inlet 55; a third check valve 54 for preventing fluid from entering the second chamber 26 through the second outlet 52. It would have been obvious to one having ordinary skill in the art at the time of invention to provide the first and second outlets, the linkage between the first outlet and the second inlet, and the three check valves of Ganzel to the pump of Jones to create a high pressure screw pump capable of producing the high pressure of Jones (col. 1 ll. 25-35) with a reduction in noise due to vibration (col. 1 ll. 41-49).

11. Claims 13, 23, 37 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones 4,856,967. Jones teaches the invention as substantially claimed and discussed above but fails to teach first and second pistons having a stroke of about 6 inches but it is well settled in the art that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233 such that one skilled in the art would have been motivated to provide the adjoined pistons of Jones having a stroke length of 6 inches to displace a precise volume of high pressure gas as required of a fluid pump (col. 3 ll. 12-20).

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Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure are cited on form 892 herewith.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard J. Weinstein whose telephone number is 571-272-9961. The examiner can normally be reached on Monday - Thursday 7:00 - 5:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg can be reached on 571-272-4828. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



LJW

06/31/2007



MICHAEL KOCZO
PRIMARY EXAMINER
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